Ares Vallis — The Landing on Mars
(P-48702)

The *Sojourner* rover climbs a hill on its way to another discovery in this artist's conception of the Mars Pathfinder lander at its landing site in the Ares Vallis region of Mars. The rover is specially equipped with instrumentation that will allow scientists to measure the elemental composition of rocks and soil and deduce their mineralogy and origin.

The lander is shown fully deployed on the Martian surface. Key features are *Sojourner*, the ramp it rolled off, the solar cell–covered petals, the Imager for Mars Pathfinder (IMP) on the deployed mast, the high-gain antenna (the flat disk, which is pointing toward Earth), the low-gain antenna (the tube pointing straight up), the main electronics module (inside the white box) and the meteorology mast (with three wind socks).

The rover navigates through "dead reckoning," using waypoints provided to it via the lander's telecommunication gear and the Deep Space Network on Earth. The waypoints are determined by an operator at the Jet Propulsion Laboratory in Pasadena, California, who can see the local Martian terrain in three dimensions using stereo-image pairs taken from the lander's IMP camera (mounted about eye-level above the Martian terrain). The IMP can also image in 12 colors that will allow scientists to infer the mineralogy of nearby rocks from the color spectrum and hopefully gain a better understanding of Mars' geological history. Many unanswered questions hinge on understanding what the early history of Mars was like and what the nature of the Martian environment was at that time.

Artist's rendition by Pat Rawlings.

Mars Pathfinder Mission

Mars Pathfinder, the second Discovery class mission of the National Aeronautics and Space Administration (NASA), will be the first U.S. spacecraft to land on the Red Planet since Viking 21 years ago. Consisting of a cruise stage, an aeroshell, a lander, a microrover and several science instruments, Mars Pathfinder will land on the surface of Mars on July 4, 1997.

The Mars Pathfinder mission was developed to demonstrate the technologies needed for low-cost lander missions. Pathfinder's rover, named *Sojourner*, along with three science instruments — a stereoscopic Imager for Mars Pathfinder (IMP) with 12 color filters on an extendible mast, an Atmospheric Structure Instrument/Meteorology Package (ASI/MET) and an Alpha Proton X-ray Spectrometer (APXS) — will perform detailed investigations of the Martian surface. The data gathered will include information on surface geology, mineralogy and elemental composition of rocks and soil, magnetic properties of dust and a variety of atmospheric investigations, including daily weather reports and the structure of the atmosphere with altitude.

The landing site on Mars is at the mouth of a giant, catastrophic outflow channel called Ares Vallis. This site offers the potential to identify and analyze a variety of crustal materials from different regions on Mars.

The Mars Pathfinder mission is managed for the National Aeronautics and Space Administration by the Jet Propulsion Laboratory (JPL) of the California Institute of Technology.

Visit the Mars Pathfinder Internet website at http://mpfwww.jpl.nasa.gov

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